

ABSTRACT OF THE DISCLOSURE

The improved diffractive-based laser scanning system of the present invention monitors portions of the laser light beams generated by a laser light source (e.g., VLD) employed therein to generate a mode switching signal indicative of a shift in the characteristic wavelength of the laser light beams emitted from the laser light source. In response thereto, a temperature controller selectively heats (or cool) the laser light source to minimize and avoid such wavelength changes, thereby mitigating any potential problems caused by such wavelength changes (for example, unwanted beam distortion and signal processing errors as described above). Preferably, mode switching (e.g., change in characteristic wavelength of light emitted from the laser light source) is detected by monitoring a zeroth diffractive order beam produced by a diffractive element of the system. Moreover, temperature control of the laser light source is preferably accomplished using active heating elements (e.g., a heating resistor) and passive cooling elements (e.g., a heat sink) in thermal contact with the laser light source. In addition, temperature control of the laser light source is preferably accomplished over a heating range (between a minimum heat and maximum heat applied to the laser light source), whereby temperature within this range is approximated by a look-up table. Such a scheme may be implemented by an inexpensive microcontroller, which eliminates the costs for directly measuring the temperature of the laser light source thereby contributing further to a simple and cost-effective design.